

Korean Species of the Genus *Sepedophilus* Gistel (Coleoptera, Staphylinidae, Tachyporinae)

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Abstract A taxonomic study of the tachyporine genus *Sepedophilus* Gistel in Korea is presented. Eight species are recognized from Korea. Among them, seven species, *Sepedophilus amurensis* Schülke, *S. fimbriatus* (Sharp), *S. marshami* (Stephens), *S. simulans* Nakane and Sawada, *S. subarmatus* Naomi and Maruyama, *S. tibialis* (Sharp), and *S. varicornis* (Sharp) are reported for the first time in Korea. A key, descriptions, and drawings of diagnostic characters of known Korean *Sepedophilus* species are presented.

Key words Taxonomy, Coleoptera, Staphylinidae, *Sepedophilus*

INTRODUCTION

The genus *Sepedophilus* Gistel is one of the largest group of the subfamily Tachyporinae. They are usually found in rotting wood, under bark and decaying organic matter (Campbell, 1976b). Some species are associated with fungi. At least some adults and larvae are fungivorous (Campbell, 1976b; Newton, 1984). The genus *Sepedophilus* is easily recognized by combination of: strongly convex and densely pubescent body, small conical labial palpi, and protibia with external ctenidium (Campbell, 1976a, b; Newton, 1984, 1990). The genus is world wide (Campbell, 1976b; Naomi and Maruyama, 1997a; Newton, 1984) and more than 350 species have been described. In Korea, *Sepedophilus bipustulatus* (Gravenhorst) is the only species reported by Yuh *et al.* (1985) and Kim *et al.* (1994).

In this paper, we report seven additional Korean species, *Sepedophilus amurensis* Schülke, *S. fimbriatus* (Sharp), *S. marshami* (Stephens), *S. simulans* Nakane and Sawada, *S. subarmatus* Naomi and Maruyama, *S. tibialis* (Sharp), and *S. varicornis* (Sharp), and present a key to the Korean *Sepedophilus* species and descriptions with line drawings.

The terminology of taxonomic characters used in this study followed Campbell (1976b). Materials for this study are deposited in the Chungnam National University Insect Collection, Daejeon City, Korea (CNUIC).

SYSTEMATICS

Genus *Sepedophilus* Gistel, 1856 알뽕족반날개속 (개칭)

Conurus Stephens, 1829: 22; Erichson, 1839: 218; Ganglbauer, 1895: 354.

Sepedophilus Gistel, 1856: 267; Campbell, 1976b: 5.

Conosomus Motschulsky, 1857: 54.

Conosoma Kraatz, 1857: 431; Fowler, 1888: 190; Sharp, 1888: 313; Luze, 1902: 19.

Diagnosis. Body moderately to strongly convex; length 3.0–5.5 mm in Korean species; body color yellowish brown to dark brown. Antennae with 11 antennomeres; antennomeres 1–3 or 4 not pubescent. Maxillary palpomere 4 much narrower and shorter than 3. Labial palpomere 3 slightly longer than 2. Pronotum strongly convex. Protibia with ctenidium at apex. Elytra pubescent with or without remarkable spot and lateral bristles. Abdomen with or without lateral bristles.

Male: Tergite VIII broadly one plate with a few long setae. Sternite VIII with deep emargination. Median lobe flat or slender, parameres long.

Female: Tergite VIII with 4 lobes and many setae. Sternite VIII broadly one plate with many long setae and sensory setae at apex.

Remark. *Sepedophilus* Gistel is easily distinguished from other tachyporine genera by strongly convex and densely pubescent body, and protibia with external ctenidium.

Key to the Korean species of the genus *Sepedophilus*

1. Mesotibial ctenidium extending along apex and curving up tibia; aedeagus flat and broad 2
- 1'. Mesotibial ctenidium restricted to the apex; aedeagus slender 4
2. Bicolored elytra; reddish elytral humeral region *S. tibialis* (Sharp)
- 2'. Unicolored elytra 3
3. Smaller size, about 4.0 mm; apex of median lobe pointed *S. amurensis* Schülke
- 3'. Larger size, 5.0–5.5 mm; apex of median lobe rounded *S. fimbriatus* (Sharp)
4. Elytra with remarkable spots or marking 5
- 4'. Elytra without spots or marking 7
5. Elytra with a pair of marking; medium size, 3.5–4.0 mm *S. simulans* Nakane and Sawada
- 5'. Elytra with remarkable spots 6
6. Larger size, about 4.5 mm; elytra with remarkable 1 pair of spots *S. bipustulatus* (Gravenhorst)
- 6'. Smaller size, about 3.0 mm; elytra with remarkable 3 pairs of spots *S. subarmatus* Naomi and Maruyama
7. Unicolored elytra; no abdominal lateral bristles *S. marshami* (Stephens)
- 7'. Reddish elytral humeral region; short abdominal lateral bristles *S. varicornis* (Sharp)

***Sepedophilus amurensis* Schlke, 1995** 시베리아알뽕족반날개 (신칭)

(Figs 1-3)

Sepedophilus amurensis Schlke, 1995: 32.

Description. Body 4.0 mm; strongly convex; dark brown. Head dark brown to black; length to width ratio about 0.8. Antennae long and slender; antennomeres 1-3 smooth, 4 sparsely, 5-11 densely pubescent; antennomere 10 length to width ratio about 1.3-1.4; length ratio of antennomere 11 to 10 about 1.7-1.8. Length ratio of maxillary palpomere 4 to 3 about 0.6-0.7. Length ratio of labial palpomere 3 to 2 about 1.3. Pronotum dark brown; length to width ratio about 0.6. Elytra reddish brown to dark brown; without spot and lateral bristles; elytra length to pronotum length ratio about 1.3. Protibia without apical spur. Mesotibia with 1 apical spur; mesotibial ctenidium extending along apex and curving up tibia. Abdominal tergites III-VI with long bristles.

Male: Tergite VIII (Fig. 1) with 7 setae. Sternite VIII (Fig. 2) with 9 setae. Aedeagus (Fig. 3) flat and broad; apex of median lobe sharp; paramere flat and round.

Material examined. 1 ♂, 1 ♀, Mt. Gyeongbansan (900 m), Hongcheon, Gangwon-do, 21 VI 1995 H.C. Park; 1 ♂, Chilyeon Fall, Mt. Deokkyusan, Jeonlabuk-do, 22-24 V 1998, K.-L. Yu & H.-J. Lim, ex FIT.

Distribution. Korea, East-Siberia.

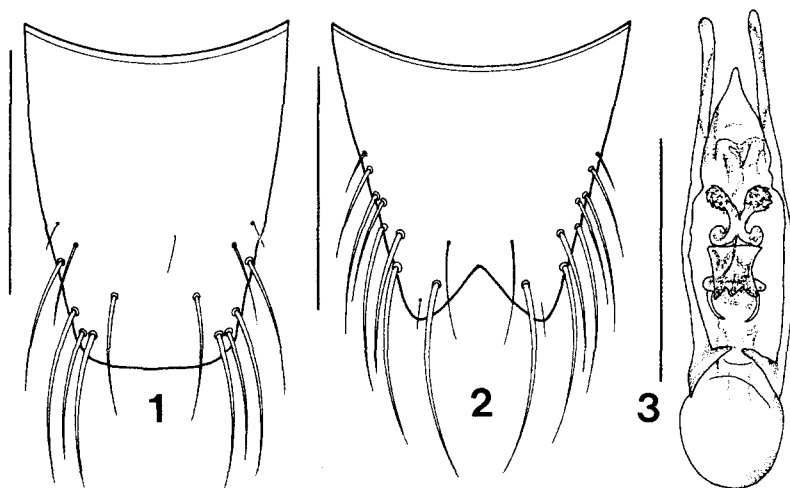
***Sepedophilus bipustulatus* (Gravenhorst, 1802)** 쌍무늬알뽕족반날개 (개칭)

(Figs 4-6)

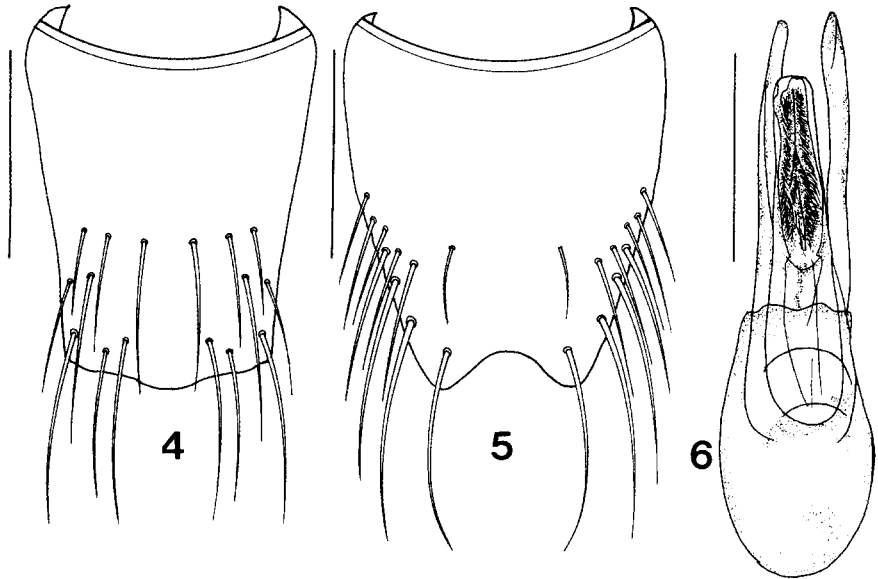
Tachyporus bipustulatus Gravenhorst, 1802: 132.

Sepedophilus bipustulatus: Yuh et al., 1985: 250.

Conosoma bipustulatum: Erichson, 1839: 223; Kraatz, 1856: 437; Thomson, 1861: 148;



Figs 1-3. *Sepedophilus amurensis* Schülke. 1, Male tergite VIII; 2, male sternite VIII; 3, male aedeagus. Scale bars = 0.5 mm.



Figs 4-6. *Sepedophilus bipustulatus* (Gravenhorst). 4, Male tergite VIII; 5, male sternite VIII; 6, male aedeagus. Scale bars = 0.5 mm.

Fowler, 1888: 192; Luze, 1902: 37; Bernhauer and Schubert, 1916: 466; Lohse, 1964: 235; Krasutskiy, 1996: 74.

Description. Body 4.5 mm; strongly convex; dark brown. Head dark brown; length to width ratio about 0.8. Antennae long; antennomere 1-3 smooth, 4 sparsely, 5-11 densely pubescent; length ratio of antennomere 11 to 10 about 1.6. Length ratio of maxillary palpomere 4 to 3 about 0.6. Length ratio of labial palpomere 3 to 2 length ratio about 2. Pronotum length to width ratio about 0.6. Elytra with large red colored 1 pair of spots at humeral region; elytra length to width ratio about 1.5; elytra length to pronotum length ratio about 1.2. Protibia with 1 apical spur. Mesotibia with 1 apical spur; mesotibial ctenidium restricted to the apex. Abdominal tergites III-VI with long bristles.

Male: Tergite VIII (Fig. 4) with 9 setae. Sternite VIII (Fig. 5) with 10 setae. Aedeagus (Fig. 6) slender; apex of median lobe rounded; paramere slender.

Material examined. 1 ♂, 1 ♀, Piagol, Mt. Jirisan, Gurye-gun, Jeonlanam-do, 24-27 V 2000, K.-J. Ahn, U.-S. Hwang & S.-J. Park, ex FIT.

Distribution. Korea, Japan, China, Siberia, West Siberia, Europe.

***Sepedophilus fimbriatus* (Sharp, 1888) 검은발목알뽕족반날개 (신칭)**

(Figs 7-11)

Conosoma fimbriatum Sharp, 1888: 454; Bernhauer and Schubert, 1916: 467.

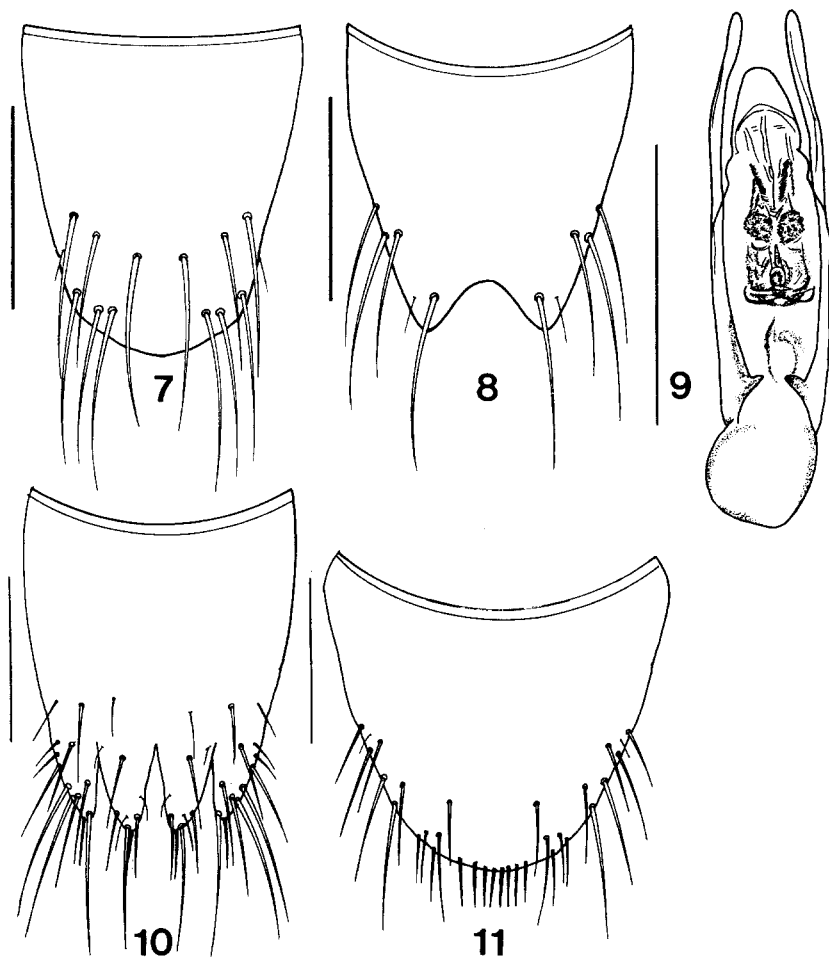
Sepedophilus fimbriatus: Watanabe and Shibata, 1972: 65; Schilke, 1995: 39.

Description. Body 5.0–5.5 mm; strongly convex; dark brown. Head dark brown; length to width ratio about 0.8. Antennae long; antennomere 1–2 smooth, 3 sparsely, 4–11 densely pubescent; length ratio of antennomere 11 to 10 about 1.8–2.0. Length ratio of maxillary palpomere 4 to 3 about 0.6–0.7. Length ratio of labial palpomere 3 to 2 about 1.2–1.4. Pronotum dark brown; length to width ratio about 0.6–0.7. Elytra dark brown; elytra length to width ratio about 1.3–1.4; elytra length to pronotum length ratio about 1.2. Protibia without apical spur. Mesotibia with 1 apical spur; mesotibial ctenidium extending along apex and curving up tibia. Abdominal tergites III–VI with long lateral bristles.

Male: Tergite VIII (Fig. 7) with 7 setae. Sternite VIII (Fig. 8) with 5 setae. Aedeagus (Fig. 9) flat; apex of median lobe rounded; paramere slender.

Female: Tergite VIII (Fig. 10) with 18 setae and 2 sensory setae; emargination of outer lobes subequal to inner lobes. Sternite VIII (Fig. 11) with 10 setae and 6 sensory setae.

Material examined. 1 ♂, Secheon Park, Mt. Sikjangan, Daejeon City, Chungcheongnam-do, ? IX



Figs 7-11. *Sepedophilus fimbriatus* (Sharp). 7, Male tergite VIII; 8, male sternite VIII; 9, male aedeagus; 10, female tergite VIII; 11, female sternite VIII. Scale bars = 0.5 mm.

1999, U.-S. Hwang, ex mushroom; 6 ♂, 7 ♀, 17 VII 2000; 11 ♂, 6 ♀, 21 VII 2000, H.-J. Kim; 1 ♂, Seongpanak, Jeju-do, 28 IX ?, G.-S. Lee, ex under bark.

Distribution. Korea, Japan.

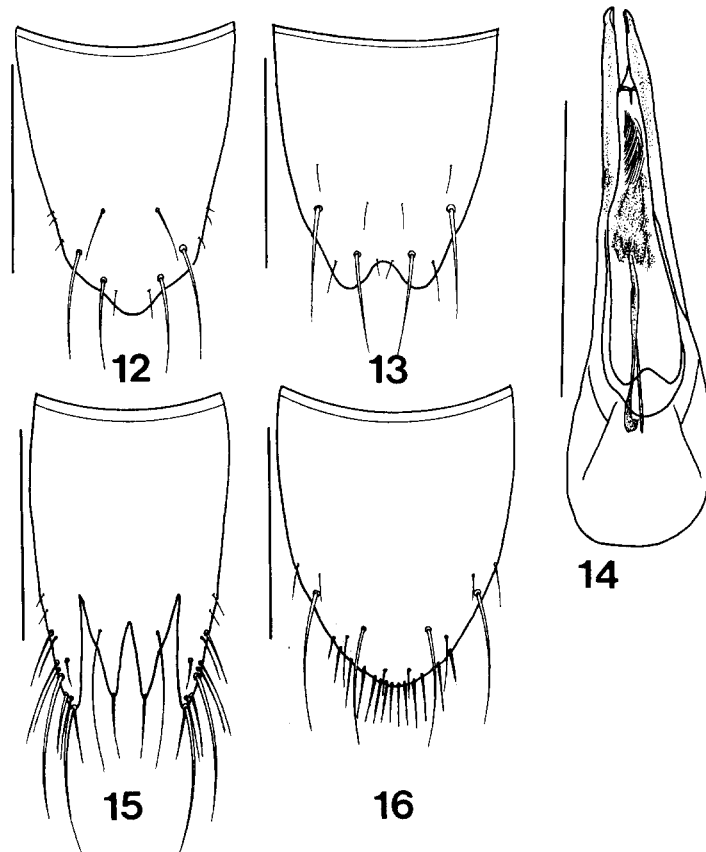
***Sepedophilus marshami* (Stephens, 1832) 홀쪽알뽕족반날개 (신칭)**

(Figs 12-16)

Conurus marshami Stephens, 1832: 189.

Sepedophilus marshami: Campbell, 1976: 14; Lohse and Locht, 1989: 180; Schülke, 1995: 35.

Description. Body 4.0 mm; moderately convex; dark brown. Head dark brown; length to width ratio about 0.8. Antennomere 1-2 smooth, 3 sparsely, 4-11 densely pubescent; antennomere 10 length to width ratio about 1.0; length ratio of antennomere 11 to 10 about 1.8-2.0. Length ratio of maxillary palpomere 4 to 3 about 0.6. Length ratio of labial palpomere 3 to 2 about 1.0-1.3. Pronotum dark brown; length to width ratio about 0.7. Elytra reddish brown without spot; elytra length to pronotum



Figs 12-16. *Sepedophilus marshami* (Stephens). 12, Male tergite VIII; 13, male sternite VIII; 14, male aedeagus; 15, female tergite VIII; 16, female sternite VIII. Scale bars = 0.5 mm.

length ratio about 1.4–1.5. Protibia with 1 apical spur. Mesotibia with 2 apical spurs; mesotibial ctenidium restricted to the apex. Abdomen without long lateral bristles.

Male: Tergite VIII (Fig. 12) with 6 setae. Sternite VIII (Fig. 13) with 4 setae. Aedeagus (Fig. 14) slender; apex of median lobe acutely produced; long setose area and basal tube; paramere slender and rounded.

Female: Tergite VIII (Fig. 15) with 12 setae and 2 sensory setae; emargination of outer lobes deeper than inner lobes. Sternite VIII (Fig. 16) with 6 setae and 7 sensory setae.

Material examined. 1 ♂, 1 ♀, Mt. Chukryeongsan, Sudong-myeon, Namyangju City, Gyeonggi-go, 13 IX 1999, U.-S. Hwang & H.-J. Kim, ex sifting; 4 ♂, 5 ♀, Mt. Oseosan, Hongseong-gun, Chungcheongnam-do, 19–21 V 1999, U.-S. Hwang & H.-J. Kim, ex FIT; 1 ♂, 1 ♀, Mt. Wolmyeongsan, Buyeo-gun, 3 V–1 VI 2000, U.-S. Hwang & H.-J. Kim, ex FIT; 1 ♀, Mt. Sunamsan, Euseong-gun, Gyeosangbuk-do, 18 VII 1998, Y.-B. Cho; 1 ♂, Baekyangsa Area, Mt. Naejangsan, Jeongeob City, Jeonlabuk-do, 25–26 V 1999, U.-S. Hwang & H.-J. Kim, ex FIT; 1 ♀, Chilyeon Fall, Mt. Deokyusan, 22–24 V 1998, K.-L. Yu & H.-J. Lim, ex FIT; 1 ♂, 28–29 V 1999, Y. B. Cho, ex sifting; 1 ♂, 1 ♀, Piagol, Mt. Jirisan, Gurye-gun, Jeonlanam-do, 24–27 V 2000, K.-J. Ahn, U.-S. Hwang & S.-J. Park, ex FIT.

Distribution. Korea, East Siberia, Europe, north America.

***Sepedophilus simulans* Nakane and Sawada, 1960 반무늬알뽕족반날개 (신칭)**

(Figs 17–21)

Sepedophilus simulans Nakane and Sawada, 1960: 124; Watanabe and Shibata, 1972: 65; Naomi and Maruyama, 1997b: 73.

Description. Body 3.5–4.0 mm; convex, reddish brown. Head dark brown; length to width ratio about 0.8. Antennae long; length ratio of antennomere 11 to 10 about 2.0. Length ratio of maxillary palpomere 4 to 3 about 0.8. Length ratio of labial palpomere 3 to 2 about 1.2. Pronotum dark brown; length to width ratio about 0.7–0.8. Elytra reddish brown with dark brown marking in posterior region; elytra length to width ratio about 1.6–1.7; elytra length to pronotum length ratio about 1.3. Protibia without apical spur. Mesotibia with 1 apical spur; mesotibial ctenidium restricted to the apex. Abdominal tergites III–VI with long bristles.

Male: Tergite VIII (Fig. 17) with 7 setae. Sternite VIII (Fig. 18) with 6 setae. Aedeagus (Fig. 19) with rectangular sclerite.

Female: Tergite VIII (Fig. 20) with 15 setae and 2 sensory setae; emargination of outer lobes deeper than inner lobes. Sternite VIII (Fig. 21) with 8 setae and 7 sensory setae.

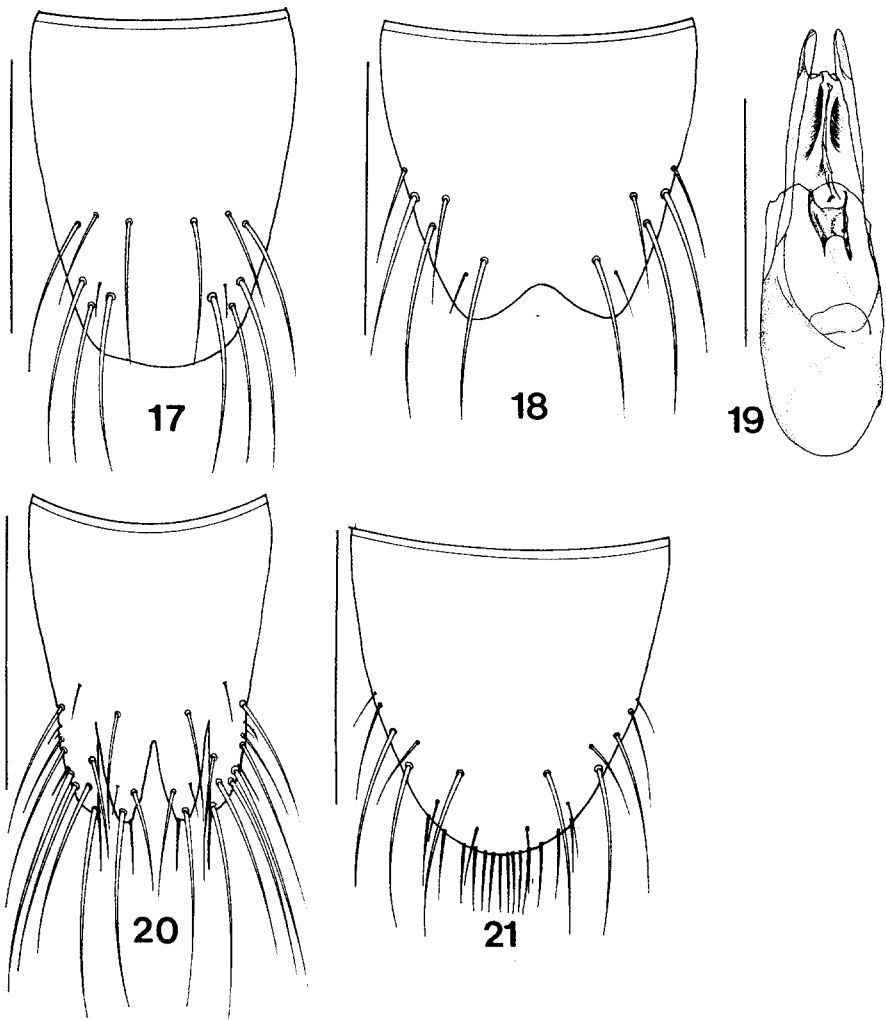
Material examined. 15 ♂, 8 ♀, Piagol, Mt. Jirisan, Gurye-gun, Jeonlanam-do, 24–27 V 2000, K.-J. Ahn, U.-S. Hwang & S.-J. Park, ex FIT.

Distribution. Korea, Japan.

***Sepedophilus subarmatus* Naomi and Maruyama, 1997 석점알뽕족반날개 (신칭)**

(Figs 22–24)

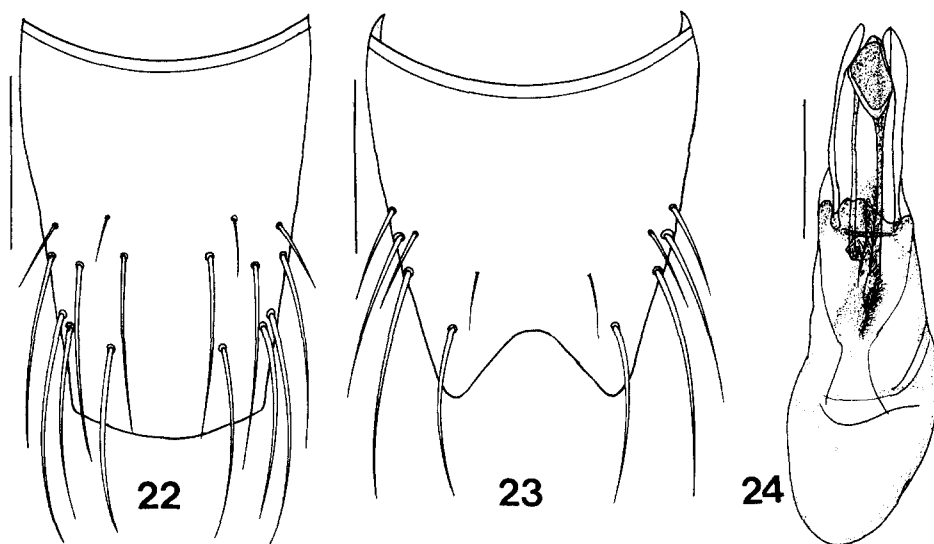
Sepedophilus subarmatus Naomi and Maruyama, 1997a: 246.



Figs 17-21. *Sepedophilus simulans* Nakane & Sawada. 17, Male tergite VIII; 18, male sternite VIII; 19, male aedeagus; 20, female tergite VIII; 21, female sternite VIII. Scale bars = 0.5 mm.

Description. Body 3.0 mm; convex, light brown. Head reddish brown. Antennae short and stout; antennomeres 6-9 dark brown; Length ratio of antennomere 11 to 10 about 1.6. Length ratio of maxillary palpomere 4 to 3 about 0.6. Length ratio of labial palpomere 3 to 2 about 1.5. Pronotum light to reddish brown; pronotum length to width ratio about 0.7. Elytra light to reddish brown with 3 pair spots; elytra with 6 lateral bristles and apical bristles; elytra length to pronotum length ratio about 1.2. Protibia with 1 apical spur. Mesotibia with 2 apical spurs; mesotibial ctenidium restricted to the apex. Abdominal tergite III-VI with long bristles.

Male: Tergite VIII (Fig. 22) with 8 setae. Sternite VIII (Fig. 23) with 6 setae. Tergite IX with 7 long and 4 short setae. Aedeagus (Fig. 24) with apical sclerite and straight basal tube; paramere slightly longer than median lobe; curved at apex.



Figs 22-24. *Sepedophilus subarmatus* Naomi & Maruyama. 22, Male tergite VIII; 23, male sternite VIII; 24, male aedeagus. Scale bars=0.2 mm.

Material examined. 1 ♀, Mt. Sikjangan, Daejeon City, Chungcheongnam-do, Secheon Park, 12 VII 2000, U.-S. Hwang, ex mushroom; 1 ♂, Bongmyeong-dong, Gongju City, 11 VII 1999, M.-H. Kim, ex mushroom.

Distribution. Korea, Japan.

Remarks. This species is easily distinguished from other Korean species by three pairs black spots on elytra and collected from mushrooms.

***Sepedophilus tibialis* (Sharp, 1888) 큰붉은어깨알뽕족반날개 (신칭)**

(Figs 25-29)

Conosoma tibiale Sharp, 1888: 454; Bernhauer and Schubert, 1916: 471.

Sepedophilus tibialis: Watanabe and Shibata, 1972: 65; Schilke, 1995: 41.

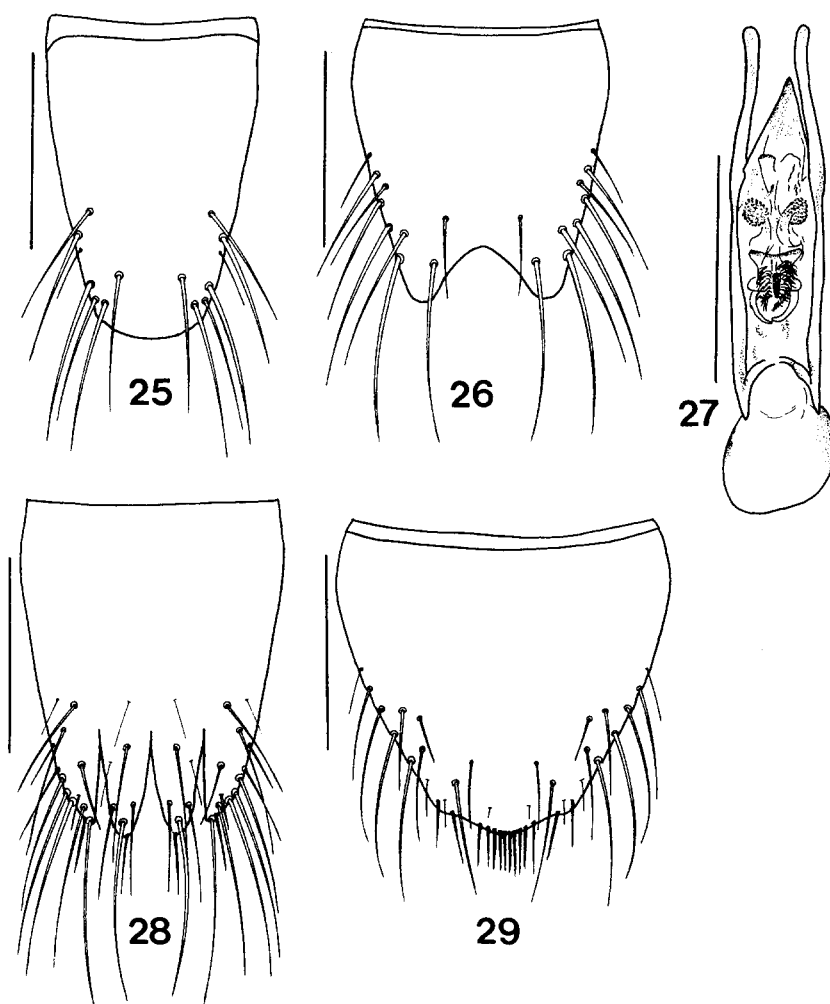
Description. Body 5.0 mm; Strongly convex; color dark brown. Head dark brown to black; length to width ratio about 0.8. Antennae long and slender; antennomere 1-2 smooth, 3-4 sparsely, 5-11 densely pubescent; antennomere 10 length to width ratio about 1.5-1.6.; length ratio of antennomere 11 to 10 about 1.5-1.6. Length ratio of maxillary palpomere 4 to 3 about 0.5-0.7. Length ratio of labial palpomere 3 to 2 about 1.3-1.5. Pronotum dark brown; length to width ratio about 0.6-0.7. Elytra dark brown; humeral region reddish brown; basal region brown; lateral bristle absent; elytra length to pronotum length ratio about 1.3. Protibia without apical spur. Mesotibia with 1 apical spur; mesotibial ctenidium extending along apex and curving up tibia. Abdominal tergites III-VI with long bristles.

Male: Tergite VIII (Fig. 25) with 7 setae. Sternite VIII (Fig. 26) with 9 setae. Aedeagus (Fig. 27) flat and

broad; apex of median lobe sharp; paramere flat and broad.

Female: Tergite VIII (Fig. 28) with 18 setae and 2 sensory setae; emargination of outer lobes subequal to inner lobes. Sternite VIII (Fig. 29) with 12 setae and 7 sensory setae.

Material examined. 1 ♀, Mt. Odaesan, Pyeongchang-gun, Gangwon-do, 8 VII 1998, H.-J. Kim, ex mushroom; 1 ♂, Mt. Hambaeksan, Jeongseon-gun, 13 VII 1999, U.-S. Hwang, ex mushroom; 3 ♂, 2 ♀, Mt. Gariwangsan, 16 VII 2000; 1 ♂, Mt. Taebaeksan, Taebaek City, 16 VII 1999, H.-J. Kim, ex sifting; 1 ♀, Mt. Yongmunsan, Yangpyeong-gun, Gyeonggi-do, 2-4 VII 1998, K.-L. Yu & H.-J. Lim, ex FIT; 4 ♂, 1 ♀, 19 VIII 1998, Y.B. Cho, ex bait trap; 1 ♀, Mt. Seondalsan, Bonghwa-gun, Gyeongsangbuk-do, 23-25 VI 1998, K.-L. Yu & H.-J. Lim, ex FIT; 1 ♂, Cheondong Area, Mt. Sobaeksan, Danyang-gun, 7-9 V 1999, U.-S. Hwang & H.-J. Kim, ex bait trap; 2 ♂, 1 ♀, Piagol, Mt.



Figs 25-29. *Sepedophilus tibialis* (Sharp). 25, Male tergite VIII; 26, male sternite VIII; 27, male aedeagus; 28, female tergite VIII; 29, female sternite VIII. Scale bars = 0.5 mm.

Jirisan, Gurye-gun, Jeonlanam-do, 24-27 V 2000, K.-J. Ahn, U.-S. Hwang & S.-J. Park, ex FIT.

Distribution. Korea, Japan.

Remarks. This species is distinguished from other Korean species by reddish colored elytral humeral region and long lateral bristles. Some specimens were collected from mushrooms.

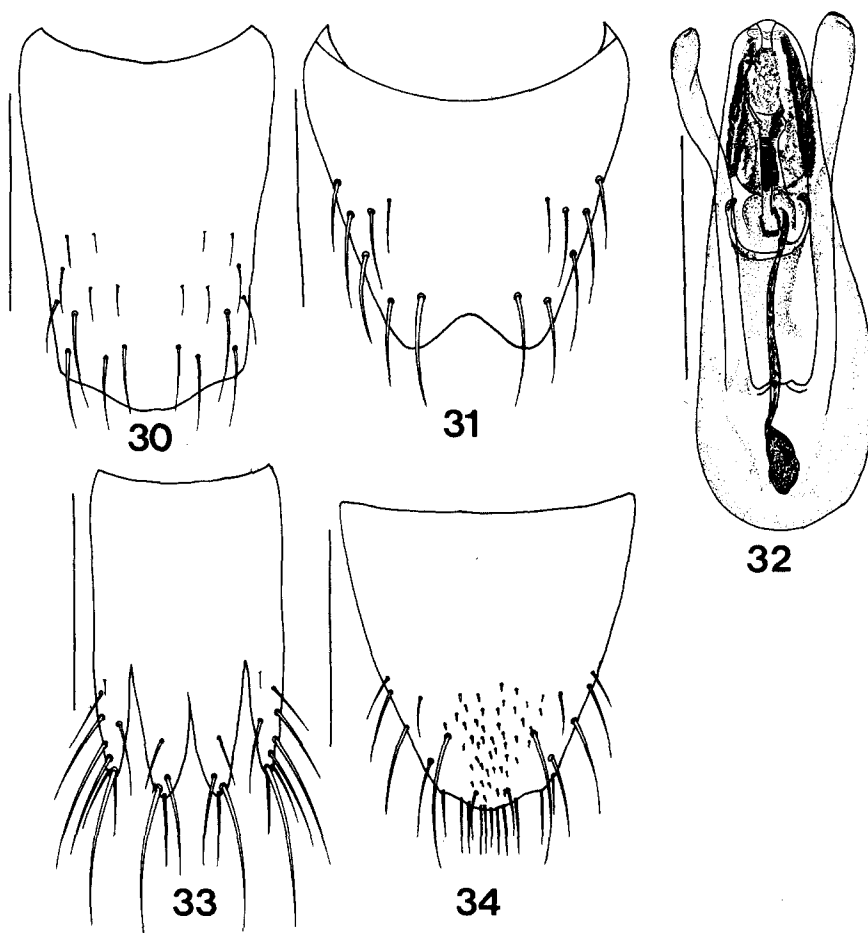
***Sepedophilus varicornis* (Sharp, 1888) 붉은어깨알뽕족반날개 (신칭)**

(Figs 30-34)

Conosoma varicorne Sharp, 1888: 455; Bernhauer and Schubert, 1916: 471; Watanabe, 1961: 354.

Sepedophilus varicornis: Watanabe and Shibata, 1972: 65.

Description. Body 4.0-4.5 mm; convex, dark brown. Head dark brown; length to width ratio about 0.7. Antennae long and stout; length ratio of antennomere 11 to 10 about 1.6. Length ratio of maxillary



Figs 30-34. *Sepedophilus varicornis* (Sharp). 30, Male tergite VIII; 31, male sternite VIII; 32, male aedeagus; 33, female tergite VIII; 34, female sternite VIII. Scale bars = 0.5 mm.

palpomere 4 to 3 length ratio about 0.7. Length ratio of labial palpomere 3 to 2 length ratio about 1.6. Pronotum dark brown; pronotum length to width ratio about 0.6. Elytra dark brown; humeral region reddish brown; spot and lateral bristles absent; elytra length to width ratio about 1.6; elytra length to pronotum length ratio about 1.3. Protibia with 1 apical spur. Mesotibia with 2 apical spurs; mesotibial ctenidium restricted to the apex. Abdominal tergite III–VI with short bristles.

Male: Tergite VIII (Fig. 30) with 7 setae. Sternite VIII (Fig. 31) with 7 setae. Aedeagus (Fig. 32) with long basal tube; apex of median lobe rounded; paramere slender and rounded at apex.

Female: Tergite VIII (Fig. 33) with 10 setae and 2 sensory setae. Sternite VIII (Fig. 34) with 7 setae and 5–6 sensory setae.

Material examined. 1 ♂, 4 ♀, Mt. Gariwangsan, Jeongseon-gun, Gangwon-do, 16 VII 2000, U.-S. Hwang, ex mushroom; 2 ♂, 1 ♀, Naejangsa Area, Mt. Naejangsan, Jeongeob City, Jeonlabuk-do, 25 VI 2000, H.-J. Kim, ex under bark.

Distribution. Korea, Japan, China.

ACKNOWLEDGMENTS

We thank Dr. Y.B. Cho (Natural History Museum, Hannam University, Daejeon City) and K.S. Lee (Jeju City, Korea) for providing specimens. This research was supported by Korea Research Foundation Grant (2000-041-D00261) awarded to K.-J. Ahn.

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한국산 알뽕족반날개속의 분류학적 연구 (딱정벌레목, 반날개과)

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한국산 알뽕족반날개속에 대한 분류학적 연구를 수행하였다. 조사된 8종 중에서 한국산 미기록종은 다음 7종으로 밝혀졌다: *Sepedophilus amurensis* Schülke, *S. fimbriatus* (Sharp), *S. marshami* (Stephens), *S. simulans* Nakane and Sawada, *S. subarmatus* Naomi and Maruyama, *S. tibialis* (Sharp), and *S. varicornis* (Sharp). 한국산 알뽕족반날개속에 대한 검색표를 작성하였고, 종을 기재하였으며, 진단 형질을 도식하였다.

검색어 : 분류, 딱정벌레목, 반날개과, 알뽕족반날개속

(Received: September 1, 2000)

(Accepted: November 9, 2000)